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ABSTRACT

Four hypotheses concerning the relationship between communication apprehension and four types of hand movements were formulated and tested in a study involving 74 students at an eastern university. The hand movements were emblems (hand movement not related to speech), illustrators (hand movement which accompanies speech), self-adaptors (nervous self-touching), and object-adaptors (nervous touching of objects). The first and second hypotheses stated that high communication apprehensive individuals would manifest fewer emblems and illustrators than moderates, who would manifest fewer than low communication apprehensive individuals. The third and fourth hypotheses stated that high communication apprehensive individuals would manifest more self- and object-adaptors than moderates, who would manifest more than low communication apprehensive individuals. Each subject participated in an interview that was videotaped and coded by three independent judges. The hand movements were recorded according to their frequency of occurence. Only two emblems were observed; therefore all analyses addressing the first hypothesis were dropped. The second hypothesis was partially confirmed. The third and fourth hypotheses were not confirmed. (FL)

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KINESIC CORRELATES OF COMMUNICATION APPREHENSION: AN ANALYSIS OF HAND MOVEMENTS

Considerable recent research has been devoted to the study of communication apprehension (CA) defined by McCroskey (1970) as a fear or anxiety about real or anticipated communication. Studies from a variety of sample populations indicate that approximately 20% of the entire American population experiences a high degree of CA (McCroskey, 1972). Moreover, recent research indicates that CA affects human behavior, in many cases, in a negative way.

In the instructional area, CA has been found to detrimentally affect academic performance. McCroskey and Andersen (1976) found that grade point averages of high CA's were significantly lower than other students. Scott, Yates, and Wheeless (1975) report that in a modified personalized system of instruction, students with high CA were significantly more reluctant to seek tutorial assistance than persons with low CA. McCroskey and Sheahan (1976) report that high CA's sit in the lowest interaction areas in classrooms. The instructional research indicates a pattern of avoidance by high CA's that is academically detrimental.

CA has also been shown to affect individuals negatively in an organization setting. Daly and Leth (1976) found that highly communication apprehensive job applicants were perceived as less competent, less sociable, less likely to succeed, less likely to be offered a job interview, and if interviewed, were less likely to be offered a job. Additional research by Daly and McCroskey (1975) and Scott, McCroskey, and Sheahan (in press) found that high CA's avoided high-communication occupations even when those occupations provided high status and salary.

In the interpersonal area, persons with high levels of CA are also at a disadvantage. In two studies, McCroskey, Daly, Richmond and Cox (1975) found persons with high CA to be perceived as less socially attractive, less sexually attractive, less task attractive, less attractive as a communication partner, less extroverted, less competent, less sociable and less composed.

As these studies indicate, communication apprehension is a trait that has considerable, widespread, detrimental effects on an individual.

The present study is an attempt to determine specific kinesic correlates of CA. This study is significant for two reasons. First, from a theoretical standpoint, examination of the kinesic behavior of persons experiencing CA, may indicate why they are perceived so negatively by other people. Second, identifying behaviors that are unique to persons experiencing CA may lead to improved unobtrusive identification of these individuals. Before elaborating on the significance of this research, specific hypotheses regarding CA and kinesic behavior must be formulated.

One would expect that any anxiety state, including that experienced by a person with CA, would result in behavioral changes. Research by Argyle (1972) reports that variations in voice quality, facial expressions, posture, gestures and eye contact are manifestations of an anxious state. Darwin (1965) has stated that emotional states produce muscular tension, trembling, increased perspiration, dryness of mouth, changes in voice quality and pupil dilation/constriction. The following sections will examine the major categories of kinesic hand behaviors and how CA is expected to relate to each behavior.

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Emblems and Communication Apprehension

The term "emblem" was first proposed by Efron (1941) in a study of the gestural behavior of immigrants to the US. Emblems are nonverbal acts which have a direct verbal translation or dictionary definition (Knapp, 1972). Usually iconically coded, an emblem is a publicly understood, culturally determined act that carries an entire thought and can be substituted for, repeat, or contradict a verbal statement (Efron, 1941; Ekman & Friesen, 1969b; Wolff & Gutstein, 1972). Although emblems may involve any part of the body, they typically involve the hands, head orientation, facial muscular movements or posture (Ekman & Friesen, 1972). Emblems are usually intentional, deliberate efforts to communicate (Ekman, 1976; Ekman & Friesen, 1969b, 1972, 1974) and occur most frequently when the verbal channel is disrupted by such factors as noise, distance, and organic impairment (Argyle, 1975; Cicourel, 1975). Research on emblems is scarce. Ekman (1976) indicates most nonverbal communication research has ignored the emblem. One study by Ekman and Friesen (1969) found the "hand shrug" emblem (signifying uncertainty) as a specific sign of deception and anxiety.

Since emblems are deliberate interactive behaviors that intentionally communicate and since people with high levels of CA tend to avoid communication whenever possible, it is expected that people with high CA will exhibit fewer emblems. Thus the first hypothesis is:

H_1: During a three-minute interview session highly communication apprehensive individuals will manifest fewer total emblems than will moderately communication apprehensive individuals, who will in turn manifest fewer total emblems than the low communication apprehensive individual.

Illustrators and Communication Apprehension

Hand movements which accompany verbal behavior have been termed gesticulations (Feldman, 1959; Kendon, 1972), gestures (Bates, 1975; Graham & Argyle, 1975; Leathers, 1976; Sainsbury, 1955), points (Scheflen, 1972), representational hand movements (Hoffman, 1969), object-focused movements (Freedman, 1972; Freedman, Blass Rifkin, & Quitkin, 1973; Freedman & Hoffman, 1967), and illustrators (Argyle, 1975; Cohen & Harrison, 1973; Ekman, 1976; Ekman & Friesen, 1969b, 1972, 1974b; Wolff & Gutstein, 1972). Though scholars have not accepted a single label for these gestures they are most frequently called illustrators or object-focused movements and will be called illustrators in this report.

Illustrators are socially learned movements which are directly tied to speech and illustrate or emphasize what is being conveyed verbally (Cohen & Harrison, 1973; Dittman & Llewellyn, 1969; Ekman, 1976; Ekman & Friesen, 1969b; Knapp, 1972). Illustrators can repeat, substitute, contradict, or augment the information provided verbally (Wolff & Gutstein, 1972). Ekman and Friesen (1972) maintain that illustrators are most likely to occur when a sender is excited, enthused about the topic, when maintaining the dominant role in a formal interaction or in an informal interaction when there is little concern about the impression being conveyed. Similarly, Ekman and Friesen (1972; 1974b) report that a speaker will use fewer illustrators when he feels demoralized, discouraged, tired, unenthusiastic, or in a nondominant position in a formal interaction setting. Rosenfeld and Civikly (1976) also suggest that the frequency of illustrators will decrease with a lack of enthusiasm in an interaction situation. Ekman (1976) found the frequency of illustrators to decrease when conflict is experienced in an interaction situation. Cohen and Harrison (1973) report that persons use significantly more illustrators in face-to-face interaction than over an intercom and conclude that people use illustrators to help the receiver decode the information provided verbally. Graham and Argyle (1975) indirectly support this position. They report that when no gestures were permitted, the number of words used to describe a concept increased significantly over gesture-permitted

interaction. Freedman (1972), in a psychoanalytic setting, found the manifestation of object-focused movements (illustrators) to be related to interest or enthusiasm for the topic.

Since illustrators are used more frequently by dominant persons, and related to the enthusiasm about an interaction; and since persons experiencing high levels of CA are seldom dominant and usually wish to avoid interaction; persons experiencing high levels of CA should manifest fewer illustrators than less communication apprehensive individuals. Thus the following hypothesis was formulated.

H_2: During a three minute interview session highly communication apprehensive individuals will manifest fewer total illustrators than will moderately communication apprehensive individuals who will in turn manifest fewer total illustrators than low communication apprehensive individuals.

Adaptors and Communication Apprehension

Nervous, random movements of the hand have been termed autistic gestures (Krout, 1935), body-focused movements (Freedman, 1972; Freedman, Blass, Rifkin, & Quitkin, 1973; Freedman & Hoffman, 1967), and adaptors (Ekman & Friesen, 1969b, 1972, 1974b; Jurich & Jurich, 1974; Knapp, 1972). Ekman and Friesen (1972) suggest that these types of hand movements are learned in early childhood to satisfy self-needs and later adopted as ways of dealing with stress situations and emotions. Ekman and Friesen (1969) have distinguished between three types of adaptors: self-adaptors, object-adaptors and alter-adopters. Since alter-adaptors (behaviors used to comfort or preen another individual) are reserved for intimate situations they were not considered in the present study. Self-adaptors and object-adaptors will be considered in the following sections.

Self-Adaptors. Knapp, Hart and Dennis (1974) define self-adaptors as nervous mannerisms involving random self-touching. Typical self-adaptors include playing with hair, picking at fingernails, and scratching areas of the body. Self-adaptors have no intrinsic relationship to speech and are performed with little awareness and no intention of communicating. However, they may be triggered by motives or affects which are being verbalized or by discomfort or anxiety about conversation (Ekman & Friesen, 1972). In the psychoanalytic literature, movements equivalent to self-adaptors are termed body-focused movements. Freedman (1972) defines body-focused movements as movements that are unrelated to the spoken word and involve some form of self-stimulation. The exact nature of body-focused movements is described by Freedman (1972): "One striking aspect of body-focused activity is an apparent split in the patient's attention. In part, the patient appears to maintain his dialogue with the therapist, yet, at the same time, his hands seem to be engaged elsewhere."

Communication and psychoanalytic researchers (Boomer, 1963; Dittman, Parloff, & Boomer, 1965; Ekman, 1976; Ekman & Friesen, 1969a, 1969b, 1972, 1974a, 1974b; Freedman, 1972; Freedman, Blass, Rifkin, & Quitkin, 1973; Freedman & Hoffman, 1967; Jurich & Jurich, 1974; Knapp, 1972; Knapp, Hart, & Dennis, 1974; Krout, 1935; Rosenfeld, 1966; Sainsbury, 1955) have consistently related the manifestation of self-adaptors, or body-focused movements, to psychological discomfort, anxiety, tension and/or conflict in the individual emitting the behavior.

Sainsbury's (1955) carefully controlled study of gestural movement presents support for the present research. In interviews designed to have neutral beginnings and endings, with anxiety-producing material in the middle, Sainsbury (1955) found more nervous movements in the middle portion of the interviews.

Since individuals with high CA experience increased anxiety when confronted with a communication encounter, the research presented suggests that individuals with high CA as compared to individuals with low CA, will exhibit an increase in self-adaptor activity as an indicant of the anxiety experienced.

From the literature reviewed, the following hypothesis was formulated:

H_3: During a three-minute interview session, highly communication apprehensive individuals will manifest a greater total number of self-adaptors than moderately communication apprehensive individuals who in turn will manifest a greater total number of self-adaptors than low communication apprehensive individuals.

Object-Adaptors. Object-adaptors are similar to self-adaptors, differing only in their focus of manipulation. Object-adaptors, or indirect symbolic body-focused movements, are mannerisms that involve the use of some object or prop, such as a pencil, matchbook, cigarette or part of the clothing (Ekman & Friesen, 1972; Knapp, Hart, & Dennis, 1974). To be an object-adaptor, the object incorporated in the movement cannot be used to perform or accomplish a task or goal. If the object is held or moved without serving an instrumental goal, the act is classified as an object-adaptor (Ekman & Friesen, 1972).

Though object-adaptors are usually more within awareness than self-adaptors, their meaning is similar. Ekman and Friesen (1972) contend that object-adaptors indicate a state of restlessness. The psychoanalytic research reviewed for this study held all body-focused movements, including indirect symbolic body-focused movements or object-adaptors, to be a manifestation of psychological discomfort, anxiety, apprehension, tension and/or conflict.

For an anxious individual, the rate of object-adaptor activity should approximate the rate of self-adaptor activity, given the availability of a convenient number of "objects". Therefore the research suggests that the rate of object-adaptors should increase for persons experiencing high CA as compared to persons not experiencing high levels of CA. From the literature reviewed, the following hypothesis was formulated:

H_4: During a three-minute interview session, highly communication apprehensive individuals will manifest a greater total number of object-adaptors than moderately communication apprehensive individuals, who will in turn manifest a greater total number of object-adaptors than will low communication apprehensive individuals.

It has been demonstrated that CA affects educational attainment, job selection and promotion, and interpersonal relationships in a generally negative way. The present research is an attempt to ascertain the ways in which kinesic hand behaviors vary by level of CA. Theoretically this will add to our knowledge of how the behavior of the high CA differs and perhaps will provide some insight into why these behaviors are perceived negatively by others. Further this research is a step toward developing a set of behaviors which can be utilized in unobtrusively identifying the highly communication apprehensive individual.

METHODS

Subjects

The subjects for this study were 74 undergraduate students enrolled in two communication courses at a major eastern university. The subject sample was created by recruiting in eight sections of undergraduate communication courses in which

students had previously completed the Personal Report of Communication Apprehension (PRCA; McCroskey, 1970). The nature and design of this research required dividing the subject sample into three subsamples. This division is explicated in the independent variable section of this report.

Subjects were all volunteers though subjects received two points in their course for participating. Subjects initially volunteered for a career goals interview and attended a brief interview where this information was obtained. While Ss were being interviewed by a trained confederate, a video tape was being made of the interviews. Subjects were not informed of the video-taping procedures, since such information could have caused them to "perform" for the camera and invalidate the study. Instead all subjects signed consent forms after the videotapes were made but prior to viewing them.

Data Collection Procedures

All interviews were recorded on half-inch, Scotch video-recording tape using a Sony Port-a-Pak recording unit and tripod. Video-taping was conducted through a camouflaged one-way mirror approximtately 10 feet from the interview setting.

The confederate in this research was a male graduate communication student. During the interviews, the confederate was positioned approximately four feet from the subject at a 110^{0} angle to the subject; thus proximity and body orientation were controlled. The confederate was also instructed to be gesturally as motionless as possible during all interviews.

The interview was designed to consume approximately three minutes. The questions were generally open-ended, forcing the subjects to have more time to input than the confederate.

Nonverbal Coding System

Three graduate communication students coded the video-taped interviews. The coders were trained to recognize various types of gestural behavior and to count these movements using the following scoring procedure developed for this research. The coding system gave hand movement a value of 1 when that hand movement enacted a single complete cycle. For example, if a subject scratched his/her cheek, each distinct cyclical scratch was coded as a self-adaptor. If a person gestured for emphasis, each complete cyclical gesture was coded as one illustrator.

In order to calculate reliability coefficients, the three-minute interviews were divided into 12 fifteen-second segments. This division was achieved by having an individual count off 15-second intervals orally (1, 2, 3, 4, etc.) while three graduate communication students coded the interviews. This process also yielded indices of gestural behavior over time.

Using the procedures outlined above, this research yielded total interrater reliabilities between .97 and .98 for the behaviors coded (self-adaptors, object-adaptors, illustrators, emblems). Interrater reliabilities for the 12 fifteen-second time intervals ranged between .75 and .95 for the behaviors coded. Additional reliability indicies for coded behaviors are reported in the dependent variable section of this report. All reliability indicies were computed using Nunnally's formula for three raters (Davis & Garrison, 1976).

Independent Variable

The independent variable for this study was communication apprehension as measured by a subject's total score on the 25-item version of the Personal Report of

Communication Apprehension (McCroskey, 1970; see Appendix A). This instrument consists of 25 Likert-type items designed to measure apprehension associated with oral communication in a variety of social contexts.

The PRCA has consistently yielded reliability estimates of .90 or greater (McCroskey, 1977a). In this research, the 25-item PRCA yielded a split-half (odd-even) reliability index of .94. Moderate correlations of the PRCA with related variables are an indication of the construct validity for the measure (PRCA correlated - .36 with introversion; -.48 and -.52 with self-esteem and self-acceptance, respectively; and .74 with verbal reticence). Furthermore, the PRCA produces scores that are normally distributed (McCroskey, 1975).

The nature of this study involved dividing the independent variable into three levels: low, moderate, and high communication apprehension. The following are operational definitions for the three levels of the independent variable. Low communication apprehension was operationally defined as any PRCA score less than one standard deviation below the mean PRCA score, which was a score of less than .58. Moderate communication apprehension was operationally defined as any PRCA score between one standard deviation above and below the mean PRCA score; these scores ranged from 58 to 82. High communication apprehension was operationally defined as any PRCA score greater than one standard deviation above the mean PRCA score, which was a score greater than .82.

Sex was an assigned variable in the present study. The theoretical hypotheses were tested for persons of both sexes.

Dependent Variables

Four dependent variables were used in this study. The dependent variables were four types of hand movements, which were recorded according to their frequency of occurrence. The four hand movements are: (a) emblems, (b) illustrators, (c) object-adaptors, and (d) self-adaptors.

Emblems

The following is an operational definition of emblems as dependent variables. An emblem is any hand movement which is not directly related to speech and which possesses a direct verbal translation of a word or two or a phrase (Ekman, 1976).

Emblems were measured by the three previously mentioned independent judges. For each instance the judges observed an emblem, a score of 1 was recorded for that subject in the appropriate time interval. Since only two emblems were observed in the entire study, further analyses of the emblems was dropped. This finding is consistent with Ekman's (1976) interpretation of the use of emblems, which indicates that they occur most frequently when the verbal channel is restricted by such factors as noise, distance, and/or physiological impairment.

Illustrators. Illustrators are movements which accompany verbal behavior, serving to illustrate information being conveyed verbally (Ekman & Friesen, 1972). The following is an operational definition of an illustrator. An illustrator is any hand movement which is directly tied to speech, serving to illustrate what is being conveyed verbally (Ekman & Friesen, 1972).

Coders scored one illustrator, in the appropriate time interval, each instance an illustrator was manifested in the prescribed cyclical fashion. For each complete gestural cycle, one illustrator was coded. Interrater reliability for the 12 fifteen-second time intervals ranged from .86 to .96 for illustrators (see Table 1). The three raters had a total interrater reliability of .98 for all time periods (see Table 1). Reliability indices were computed using Nunnally's formula 6-18 for three raters (Davis & Garrison, 1976).

Self-Adaptors. Self-adaptors are mannerisms involving random self-touching (Knapp, Hart & Dennis, 1974). The following is an operational definition of a self-adaptor. A self-adaptor is any hand movement which touches or manipulates another part of the body (not articles or objects) and has no intrinsic relationships to speech (Ekman & Friesen, 1972).

Self-adaptors were also scored using the cyclic scoring system described earlier. Interrater reliability for the 12 fifteen-second time intervals ranged from .84 to .92 for self-adaptors (see Table 1). The three raters had a total interrater reliability of .97 for all time periods (see Table 1). Reliability indices were computed using Nunnally's formula 6-18 for three raters (Davis & Garrison, 1976).

Object-Adaptors. Knapp, Hart, & Dennis (1974) define object-adaptors as nervous mannerisms that involve play or manipulation with foreign objects. To be an object-adaptor, the object of manipulation cannot be used to perform or accomplish a goal or task. The following is an operational definition of an object-adaptor. An object-adaptor is any hand movement which touches or manipulates an object or article (not flesh or hair or the body) and has no relationship to speech.

Object-adaptors were also scored using the cyclical coding system outlined in an earlier section of this report. Interrater reliability for the 12 fifteen-second time intervals ranged from .75 to .97 for object-adaptors (see Table 1). The three raters had a total interrater reliability of .97 for all time periods (see Table 1). Reliability indices were computed using Nunnally's formula 6-18 for three raters (Davis & Garrison, 1976).

Statistical Analysis

To test each hypothesis, the data were submitted to analysis of variance with three levels of CA serving as the independent variable and frequently scores for object-adaptors, self-adaptors, and illustrators serving as the dependent variables. Power was above .90 for detecting a large effect, .50 for detecting a medium effect, and .10 for detecting a small effect (Cohen, 1969). Significance was set at alpha = .05.

Since the theoretical hypotheses under test suggest positive linear relationships between CA and the three dependent variables, a Pearson product moment correlation was computed to assess the amount of association among the behaviors. If the dependent variables were found to be highly correlated, the data would have been submitted to a post hoc multivariate analysis of variance.

As a check on the categorization of the independent variable, regression analyses were also performed, using PRCA scores as the criterion variable and object-adaptors, self-adaptors, and illustrators as the predictor variables.

RESULTS

In this section, the results of the statistical analyses that address the theoretical hypotheses are reported.

Emblems

Since only two emblems were observed in the entire study, all statistical analyses addressing the first theoretical hypothesis were dropped. The infrequent usage of emblems in this research is, however, consistent with previous emblem research (Ekman, 1976). Ekman (1976) holds emblematic communication to occur most frequently when the communication channel is impaired by such factors as physiological impairment, noise, and/or distance. The present research situation did not possess such obstacles to warrant emblematic communication.

Illustrators

The second theoretical hypothesis was partially confirmed. The analysis of variance procedure yielded a significant effect for illustrators ($F = 5.58$, $p < .05$; power = .90; see Table 2). Communication apprehension accounted for 14% of the variance in illustrator usage. Low communication apprehensive subjects had a mean illustrator score of 47.39. Moderate communication apprehensive subjects had a mean illustrator score of 22.10, while high communication apprehensive subjects had a mean illustrator score of 34.36 (see Table 3). Thus, the theoretical hypothesis was partially confirmed. Since the obtained means were not entirely in the direction hypothesized, t-test analyses were not performed. Instead the conservative Newman-Kuels procedure was used to make post hoc comparisons among the means. The results of those comparisons are reported in the post hoc analysis section of this report.

As a check on the categorizationof the independent variable, simple regression was performed, using subjects' PRCA scores as the predictor variable and illustrator frequency as the criterion variable. The regression analysis did not produce a significant effect ($F = 2.24$, $p < .14$). These results indicate that the independent variable, communication apprehension, is not a continuous variable. Rather, the normal distribution of communication apprehension produces three distinct categories which are not linear within categories. Therefore, this study supports the notion that communication apprehension research is more predictive when the variable is treated categorically rather than continuously (McCroskey, 1977).

Testing the theoretical hypothesis with the assigned variable sex, no significant difference was observed between male and female subjects. Male subjects had a mean illustrator score of 39.30, while female subjects had a mean illustrator score of 31.26.

Self-Adaptors

The third theoretical hypothesis was not confirmed. The analysis of variance procedure did not yield a significant effect for self-adaptors ($F = 21$, $p < .81$; see Table 4). Low communication apprehensive subjects had a mean self-adaptor score of 42.00, while moderate communication apprehensive subjects had a mean self-adaptor score of 36.80. High communication apprehensive subjects had a mean self-adaptor score of 35.28.

Testing the theoretical hypothesis for both sexes, a significant effect was observed. Male subjects had a mean self-adaptor score of 49.64, while female subjects had a mean self-adaptor score of 28.46. Furthermore, male students, as compared to female subjects, had a higher mean self-adaptor score across the three levels of communication apprehension.

When treating communication apprehension as a continuous variable via regression analysis, no significant effect was observed ($F = .09$, $p < .76$).

Object-Adaptors

The fourth theoretical hypothesis was not confirmed. The analysis of variance did not yield a significant effect for object-adaptors ($F = 1.52$, $p < .22$; see Table 6). Low communication apprehensive subjects had a mean object-adaptor score of 27.67, while moderate communication apprehensive subjects had a mean object-adaptor score of 21.00. High communication apprehensive subjects had a mean object-adaptor score of 39.03.

When testing the theoretical hypothesis for both sexes, no significant effect was observed.

When treating communication apprehension as a continuous variable via regression analysis, no significant effect was observed ($F = .60$, $p < .44$).

Post Hoc Statistical Analyses

It should be initially reported that Pearson product moment computations found object-adaptors, self-adaptors, and illustrators to be theoretically different. Illustrators correlated .04 with self-adaptors and .02 with object adaptors while self-adaptors and object-adaptors correlated .17. A post-hoc multivariate analysis of variance was considered for this research but the insufficient correlation among the dependent variables did not permit such analyses.

An additional post hoc analysis addressed the obtained means for the second theoretical hypothesis. When testing the second theoretical hypothesis, the obtained means for illustrators usage were not in the direction hypothesized. Thus, the t-test was not an appropriate method for testing the hypothesis. Instead, the conservative Newman-Kuels procedure was used to make post hoc comparisons of the means. The Newman-Kuels procedure found the mean illustrator score for low CA subjects (47.39) to be significantly different from the mean illustrator score for moderate CA subjects (22.10). Comparing the mean illustrator score for low CA subjects (47.39) with that of high CA subjects (34.36) did not yield a significant relationship. A final comparison between the mean illustrator score for moderate CA subjects (22.10) with that of high CA subjects (34.36) was also nonsignificant.

DISCUSSION

In this section, the results and limitations of the present research are discussed. Also, suggestions for future research are offered.

Interpretation of Results

Emblems. Since only two emblems were observed in the entire study, all analyses addressing the first hypothesis were dropped. The infrequent manifestation of emblems in this research is, however, consistent with previous emblematic research (Ekman, 1976). Ekman and Friesen (1972) and Ekman (1976) hold emblematic communication to increase when such factors as physiological impairment, distance, and/or noise impinge on the communication situation. The laboratory situation did not present such obstacles to warrant emblematic communication. Furthermore, this research indicates that emblems are not used in interview settings or settings characterized by close positioning and high levels of attention by the communicators. It appeared that all subjects were attentive to the interviewer.

Illustrators. This research found that a curvilinear relationship exists between CA and kinesic illustrators. This relationship explains 14% of the variance in illustrator usage. Newman-Kuels analyses indicated that low CA subjects manifested more illustrators than moderate CA subjects. Though it appears that low CA subjects manifested more illustrators than high CA subjects who in turn manifested more illustrators than moderate CA subjects these relationships fell just short of statistical significance when employing the conservative Newman-Kuels test. The fact that more (though not significantly more) illustrators are used by high CA subjects than moderate CA subjects indicates that high communication apprehensive individuals do experience conflict or perceptions of inadequacy in verbal communication skills and therefore use more illustrators to compensate for their verbal inadequacy. On the other hand, moderate CA individuals do not generally perceive themselves as verbally anxious or inadequate and thus are not as gesturally expressive. The low CA individual is the most gesturally expressive. This finding is consistent with previous research (Ekman & Friesen, 1972; 1974b; Cohen & Harrison, 1973) which found the manifestation of illustrators to be related to excitement and enthusiasm about the process of communicating. Since low CA represents an opposite condition from high CA it can be assumed that low CA individuals are enthusiastic oral communicators.

McCroskey (1977b) also supports this interpretation and has further suggested an investigation of the types of illustrators most frequently used by the communication apprehensive individual. Though a number of specific categories of illustrators have been proposed by Efron (1941), Freedman and Hoffman (1967), Knapp (1972) and Ekman and Friesen (1972), the present study treated illustrations as a single category. Future investigation may find the communication apprehensive to use only specific types of illustrators. If such specificity is found, the results would support the interpretation of this research and also add further support to an unobtrusive measure of communication apprehension.

Self-Adaptors. Although the theoretical hypothesis addressing self-adaptors was not confirmed, a significant relationship emerged when testing the theoretical hypothesis with the assigned variable of sex. In this research, male subjects (consistently) had a higher mean self-adaptor score than female subjects across the three levels of communication apprehension. Since self-adaptors are reserved in the presence of others (Ekman & Friesen, 1969a, 1972, 1974b), the confederate was probably a more important "other" for females than for males. Therefore, female subjects were probably more reserved in their manifestation of self-adaptors.

Object-Adaptors. This research did not find a significant relationship between CA and object-adaptors. Furthermore, when testing the theoretical hypothesis for both sexes, a significant effect did not emerge.

Implications for Teachers.

From this research, two implications for instructors can be suggested. First, this research had demonstrated that students who frequently use illustrators will tend to be high or low CA individuals. Second, self-adaptors, object-adaptors, and emblems were not found to be related to CA and should not be used as in indicant of CA.

Reviewing the findings of this study and of those reported in Chapter 1 (Davey, 1975; McCroskey & Sheahan, 1976; Weiner, 1973), the college instructor has the following behaviors available to him/her to make only a preliminary judgement of CA.

(1) High CA individuals will choose seats at the rear and periphery of the room.
(2) High CA individuals will choose noninteraction positions in the classroom.
(3) High CA individuals may frequently use illustrators during speech.

A reliable, unobtrusive measure of CA will not be available to the instructor until: (a) research locates additional behaviors characteristic of the high CA and (b) those behaviors have been combined and systematically tested for their ability to identify these individuals.

Limitations of the Study

This research possessed four potential limitations. First, since the subjects for this study were college students, the results of the study were only generalizable to a college population.

A second limitation of the study was the single male confederate used to interview the subjects. A female confederate would have helped the researcher interpret statistical tests using the assigned variable. For example, when testing the third theoretical hypothesis for both sexes, male subjects were found to have a higher mean self-adaptor score than female subjects across the three levels of CA. This consistent relationship may not have emerged with a female confederate interviewing the same subjects.

A third limitation of this research may have been the coding of kinesic illustrators. The coding system used in this research produced only a total illustrator score for the subjects. A more thorough coding system would have recorded the number of illustrators per words spoken. Such a coding system would better measure the behavior which is, by definition, related to verbal behavior.

A final limitation of the study concerns the power of the experiment. With a total sample of 74 a three level ANOVA has a power of over .90 for detecting a large effect but a power of only .10 for detecting a small effect (Cohen, 1969). Thus, this experiment was probably incapable of detecting small difference between means.

Suggestions for Future Research

Given the limitations of this research, there is a need to continue researching the nonverbal behaviors of the communication apprehensive individual. Furthermore, continued research in this area will hopefully produce additional characteristic behaviors of CA so that future researchers can combine and empirically test for their ability to unobtrusively identify the communication apprehensive. Investigating the relationship between CA and such variables as physical appearance, attraction, facial expressions, eye contact, head movements, postural orientations, mean length of utterance, career goals, and the selection of college curriculum should produce significant findings that will contribute to the development of such a method of identification. The video tape data obtained for the present research will allow researchers to pursue some of these suggestions.

An investigation of the relationship between CA and Mehrabian's (1971) construct of immediacy should also provide a significant contribution to the theoretical development of communication apprehension. Immediacy (Mehrabian, 1971) refers to the physical and psychological closeness between or among individuals. Immediacy is characterized by such behaviors as increased eye contact, increased touching, relaxed posture, vocal warmth, positive facial expressions, greater gestural animations, and decreased proximity (Mehrabian, 1971).

The behaviors that Mehrabian (1971) holds to be characteristic of immediacy appear to be behaviors unlikely to be manifested by individuals high in CA. A study of 118 middle-school children offers support for this notion. In this study Hurt, Preiss, and Davis (1976) found high communication apprehensive students to become less immediate with their peers and teacher by isolating themselves or increasing physical proximity with them.

In Davey's (1975) study of the elementary classroom, reticent children were also found to adopt nonimmediate (withdrawal) responses. In his research, Davey (1975) identified the following reticent behaviors that are nonimmediate according to Mehrabian's (1971) construct: (a) frequently chooses to play alone; (b) habitually chooses to sit in areas outside the mainstream of activity; (c) usually quiet and passive; and (d) frequently uses gestures or other nonverbal communication displays instead of speaking.

Mehrabian (1971) also reports self-disclosure research that appears to support an investigation of the relationship between CA and immediacy. Mehrabian's (1971) self-disclosure research consistently found nonimmediate behavior to indicate discomfort, anxiety, fear, unfriendliness, and anti-social qualities.

Since high CA individuals experience anxiety when confronted with a communication situation and do attempt to avoid communication encounters whenever possible, it appears that high communication apprehensive individuals will manifest nonimmediate behaviors when confronted with a potential communication situation. Such behaviors are less likely to draw them into communication, because the manifestation

of such behavior will usually create negative perceptions in the other interactant. Although this notion has never been empirically tested, a strong argument can be presented which will allow future researchers to investigate this relationship.

With recent advances in the measurement of CA among children (Garrison & Garrison, 1977), studies similar to this research can and should be conducted. If future research can identify a significant number of nonverbal behaviors manifested by communication apprehensive children, an unobtrusive method of identifying communication apprehensive children may emerge. Such a method of identification would have the same advantages as an unobtrusive method of identifying communication apprehensive adults.

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TABLE 1

Interrater Reliability Coefficients* for Nonverbal Behaviors

Period**	Illustrators	Self-Adaptors	Object-Adaptors
1	.86	.92	.97
2	.92	.90	.94
3	.93	.90	.90
4	.94	.91	.94
5	.96	.90	.93
6	.95	.91	.93
7	.93	.90	.93
8	.96	.87	.88
9	.95	.91	.87
10	.94	.84	.75
11	.96	.89	.91
12	.95	.92	.93
Total***	.98	.97	.97

*Computed using Nunnally's formula 6-18 for three raters (Davis & Garrison, 1976).

**Each period represents a 15-second time interval. A reliability coefficient was computed for each interval.

***Total represents the interrater reliability across all time periods for the three raters.

TABLE 2

Analysis of Variance: The Effects of Communication Apprehension and Sex on Kinesic Illustrators

	EFFECT	F	p	Eta^2
(A)	Communication Apprehension	5.27	$<.01$	.14
(B)	Sex	.54	$>.05$	.01
	A x B	.59	$>.05$	.01

TABLE 3

Means for Kinesic Illustrators by Levels of Communication Apprehension (CA) and Sex

	High CA	Moderate CA	Low CA	Total
Males	32.46	30.38	49.79	39.30
Females	35.58	17.00	43.67	31.26
Total*	34.36_{ac}	22.10_{bc}	47.39_{ab}	

*Means with the same subscript are significantly different, $p < .05$.

TABLE 4

Analysis of Variance:
The Effects of Communication Apprehension
and Sex on Self-Adaptors

Effect	F	p	Eta^2
(A) Communication apprehension	.21	>.05	.01
(B) Sex	5.18	<.05	.07
A x B	.51	>.05	.01

TABLE 5

Means for Self-Adaptors
by Levels of Communication Apprehension (CA)
and Sex

	High CA	Moderate CA	Low CA	Total*
Males	52.09	54.00	45.21	49.64_a
Females	25.18	26.23	37.89	28.46_a
Total	35.75	36.81	42.35	

*Means with the same subscript are significantly different, $p < .05$.

TABLE 6

Analysis of Variance:
The Effects of Communication Apprehension
and Sex on Object-Adaptors

Effect	F	p	Eta^2
(A) Communication apprehension	1.62	>.05	.05
(B) Sex	.22	>.05	.003
A x B	.37	>.05	.01

TABLE 7

Means for Object-Adaptors
by Levels of Communication Apprehension (CA)
and Sex

	High CA	Moderate CA	Low CA	Total
Males	37.27	24.63	33.07	32.42
Females	42.00	18.77	19.22	29.00
Total	40.14	21.00	27.65	

Means were not significantly different, $p < .05$.